REMARKS/ARGUMENTS

Claims 1 and 3-8 are active in this application, claim 2 having been cancelled. Claim 1 has been amended to specify that the alkyl group of the alkylstyrene-derived structural unit is attached directly to the benzene ring of the styrene. This amendment is supported by the description of the various types of alkylstyrene-derived structural units within the specification at page 8, beginning at line 9. New claim 8 has been added which further limits the acrylic resin (b) composition makeup. This claim is supported by the specification at pages 16-17. No new matter has been added by these amendments.

The present invention relates to a polymer composition containing an addition polymerization-based block copolymer (a), an acrylic resin (b), and a softener (c), wherein the addition polymerization-based block copolymer (a) has a weight average molecular weight of 30000 to 200000 and is at least one selected from block copolymers comprising at least one polymer block A and at least one polymer block B, and hydrogenated products of the block copolymers; the polymer block A comprises mainly an aromatic vinyl compound unit containing at least 1% by mass of an alkylstyrene-derived structural unit (I) in which at least one alkyl group having 1 to 8 carbon atoms is bound directly to a benzene ring; the block copolymer B comprises a conjugated diene compound unit; and the components of the polymer composition are present in respective proportions (by mass) so that the following relationships (1) and (2) hold:

$$0.05 \leq Wb/Wa \leq 2 \qquad (1)$$

$$0 \leq Wc/(Wa+Wb+Wc) \leq 0.5 \qquad (2)$$

where Wa, Wb, and Wc are the amounts (by mass) of the components of the polymer composition: the addition polymerization-based block copolymer (a), the acrylic resin (b) and the softener (c), respectively, wherein the polymer composition has a sea-island morphology;

and wherein the polymer composition, when formed into a 2mm thick sheet-shaped article and tested for the Taber abrasion according to JIS K 6264, gives a Taber abrasion of 100mm^3 or less, the test conducted by abrading the sheet with an H-22 abrasion disk at 1000rpm while applying a 1kg load. Applicants have found that by requiring their polymer compositions to meet the requirements of the present claims, namely with respect to the use of an alkylstyrene derived structural unit where the alkyl group is directly bound to the benzene ring, the ratio of amounts of blocks A and B and the amount of softener (c), and by requiring that the composition have a sea-island morphology, the resulting compositions have significantly improved scratch and abrasion resistance.

The claims stand rejected under 35 U.S.C. 103 over Kobayashi et al or Chundry et al. As acknowledged by the Examiner, neither of these references discloses specifically the present invention, with no example shown that meets the requirements of the present invention. Additionally, neither of the references teach or suggest that by requiring the components to meet the requirements of the present claims, namely that the styrene component be an alkyl substituted styrene (with the alkyl group directly bound to the benzene ring), or that the softener be limited in accordance with relationship (2), or that the composition have a sea-island morphology, one can obtain improved scratch and abrasion resistance compared to compositions outside the requirements of the present invention.

In particular, Kobayashi discloses a composition containing 5 to 55 % by weight of a block copolymer, 0 to 40% by weight of a softening agent and 5 to 80% by weight of an acrylate copolymer. Kobayashi further discloses vinyl toluene as a vinyl aromatic compound making up a vinyl aromatic block in the block copolymer. However, as noted by the Examiner, there is no specific teaching of the specific combination of elements and properties required in the present claims. Further, Kobayashi nowhere discloses or suggests a composition as required in new claim 8 wherein the acrylate resin is defined to be a

homopolymer of methyl methacrylate or a copolymer of methyl methacrylate and one or more copolymerizable monomers selected from the group consisting of acrylic acid, metal salts of acrylic acid, acrylic acid esters, methacrylic acid, metal salts of methacrylic acid, methacrylic acid esters, vinyl acetate, aromatic vinyl compounds and maleimide compounds. The only acrylate copolymer defined by Kobayashi is a copolymer of ethylene and (meth)acrylate.

Chundry discloses a composition having about 0.1 to about 25 % of a terpolymer containing an acrylic ester, and about 0.1 to about 10% of a block copolymer of a vinyl aromatic hydrocarbon and a conjugated diene. However, Chundry nowhere discloses or suggests the present invention combination of elements and required properties, as noted by the Examiner. Further, Chundry nowhere discloses an acrylate polymer as required in new claim 8 of the present application.

Applicants have provided within the present specification data in Tables 1 and 2 showing the criticality of the present invention requirements, particularly the use of an alkylstyrene, the level of softener permitted, etc. Tables 1 and 2 are reproduced below:

Table 1

	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6	Ex. 7	Ex. 8
Polymer composition (Parts by mass) (a) addition polymerization-based block copolymer								
Block copolymer 1	70	54	40	36	47	42	65	
Block copolymer 2								70
(b) Acrylic resin								
Acrylic resin 1	30	36	55	54	47	43	20	30
(C) Softener								
DIANA PROCESS PW-380		10	5	10	6	15	15	
Irganox 1010*	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Scratch resistance (μm)	1.7	2.0	5.4	4.8	2.6	2.3	5.9	3.1
Taber abrasion (mm^3)	33	28	39	27	14	16	34	49
Light transmission (%)	87	82	88	83	82	82	85	84
Permanent set (%)	1.2	1.5	3.8	1.0	6.4	1.8	0.9	1.8
Hardness (Type A)	80	70	90	80	74	70	60	81
Tensile strength at break (MPa)	27	23	25	20	15	14	26	24
Elongation at break (%)	350	280	260	210	240	270	420	320
MFR (g/10 min)	1.3	11	5.5	13	9.5	55	49	1.5

*Irganox1010 : Hindered phenol-based antioxidant (Ciba Specialty Chemicals Co., Ltd.)

Table 2

	Comp. Ex. 1	Comp. Ex. 2	Comp. Ex. 3	Comp. Ex. 4	Comp. Ex. 5	Comp. Ex. 6	Comp. Ex. 7
Polymer composition (Parts by mass) (a) addition polymerization- based block copolymer							
Block copolymer 1	30	24	70	27			
Block copolymer 3					70	47	54
(b) Acrylic resin							
Acrylic resin 1	70	56		18	30	47	36
(C) Softener							
DIANA PROCESS PW-380		20	30	55		6	10
Irganox 1010	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Scratch resistance (μm)	16	23	11	22	11	12	12
Taber abrasion (mm^3)	230	310	320	>500	410	350	450
Light transmission (%)	79	82	81	82	83	84	88
Permanent set (%)	Rupture	6.5	5.0	7.2	4.7	5.0	4.0
Hardness (Type A)	97	83	37	10	85	75	70
Tensile strength at break (MPa)	4.8	8.3	14	4.5	15	15	13
Elongation at break (%)	180	200	650	600	300	210	260
MFR (g/10 min)	48	>100	64	>100	0.6	2.8	1.9

*Irganox1010 : Hindered phenol-based antioxidant (Ciba Specialty Chemicals Co., Ltd.)

As shown above, when the present invention compositions (Examples 1-8 of Table 1) having the required alkylstyrene component, and meeting the relationships of the present claims, the resulting composition has significantly better scratch and abrasion resistance compared to the Comparative Examples. Importantly, Comparative Examples 1-4 used the same p-methylstyrene polymer as in the present invention, but did not meet the other requirements of the claim. Namely, Comp. Examples 1 and 2 do not meet relationship (1) of the present claim, since the amount of acrylic resin is more than twice the amount of alkylstyrene resin. Comp. Example 3 does not meet the present claims since there is no acrylic resin. Comp. Example 4 does not meet relationship (2) of the present claims, since the amount of softener is more than 50% of the composition. Comp. Examples 5-7 differ from the present invention by the use of styrene based polymers, but no alkylstyrene polymer units. Accordingly, these data show the criticality of the type of polymers used (alkylstyrene vs. styrene), the ratio of styrenic to acrylic polymer (relationship (1)) and the amount of softener (relationship (2)). None of the cited references disclose or suggest the criticality of these characteristics. The results provided in the present application thus adequately rebut any assertion of obviousness over the cited references, and the rejections should be withdrawn.

The Examiner has stated that Applicants comparative examples bear almost no resemblance to the examples of the prior art. Further, the Examiner notes that Chundury (the '059 patent) requires a high amount of an inorganic to provide high abrasion resistance. The data provided in the present application point out that the present invention DOES NOT REQUIRE such an abrasive to get high abrasion resistance, but rather only needs to meet the requirements of the present claims. Further, Comparative Example 6 is close to the composition disclosed by Kobayashi. In particular, Comparative Example 6 uses styrene as an aromatic block of the block copolymer, which is the preferred aromatic block used by

Kobayashi. Further, the composition ratios used in Comparative Example 6 are comparable to that disclosed by Kobayashi.

Additionally, Comparative Example 5 is close to the composition disclosed by Chundury, since Comparative Example 5 uses styrene as an aromatic block in the block copolymer, which is the preferred aromatic block of Chundury. Further, a softening agent is not used in Comparative Example 5 and the composition ratios are similar to Chundury.

As shown in the data, the present composition provides excellent abrasion resistance even in the absence of inorganic fillers. However, both Chundury and Kobayashi require the presence of such inorganic fillers to provide their abrasion resistance. To compare against such filled compositions would be totally irrelevant as to whether the present invention composition provides a surprising result. In order to show the criticality of the present invention composition requirements in providing the abrasion resistance improvements, it is necessary to compare against a composition that is comparably devoid of inorganic fillers.

The Examiner's apparent insistence that Applicants compare exactly against a composition disclosed by either prior art reference is misplaced. Applicants have shown the criticality of meeting the present invention requirements. Neither Kobayashi nor Chundury disclose such requirements or that they can provide improved abrasion resistance even in the absence of inorganic fillers. While the Examiner states that Chundury suggests better abrasion resistance, there are no data contained therein to that effect. Further, Applicants have shown that by meeting the present invention requirements, one obtains significant improvements in scratch and abrasion resistance. This shows the criticality of the type of polymers used (alkylstyrene vs. styrene), the ratio of styrenic to acrylic polymer (relationship (1)) and the amount of softener (relationship (2)) as required in the present claims. Such criticality of the requirements is nowhere taught or suggested by the references and cannot be ignored in considering patentability of the present invention.

Claims 1 and 7 stand rejected for obviousness type double patenting over U.S. Patent 7,247,674. This rejection is traversed since there is no overlap between the claims of the present invention and the claims of the '674 patent, and the claims of the '674 patent cannot suggest the present invention as claimed. In particular, the claims of the '674 patent require the use of an α-methylstyrene. The α-methylstyrene of the patent and the alkylstyrene of the present invention are not the same, since the α-methylstyrene has a methyl group attached to the α carbon of the vinyl group of the styrene, while the present invention alkylstyrene requires that the alkyl group be attached **directly** to the benzene ring. Accordingly, the claims of the patent cannot render the present invention obvious and the rejection should be withdrawn.

Applicants submit that the application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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